

### CLAIMS

What is claimed and desired to be secured by Letters Patent is as follows:

1. A radio receiver, comprising:

a front-end circuit operable to receive a plurality of radio signals transmitted across a frequency band and generate an analog signal corresponding to a plurality of channels within said frequency band;

an analog to digital converter coupled to said front-end circuit, said analog to digital converter operable to receive and convert said analog signal to a digital signal; and

a digital processing system coupled to said analog to digital converter, said digital processing system operable to receive said digital signal and generate at least one output signal corresponding to at least one of said plurality of channels within said frequency band.

2. The radio receiver of claim 1, wherein said digital processing system generates a single output signal comprising a time-domain multiplexed serial data link.
3. The radio receiver of claim 2, further comprising a controller coupled to said digital processing system, said controller operable to receive said time-domain multiplexed serial data link and generate a plurality of signals for transmission to a plurality of end devices.
4. The radio receiver of claim 1, wherein said digital processing system generates a plurality of output signals comprising a plurality of signals for transmission to a plurality of end devices.

5. The radio receiver of claim 1, wherein said front-end circuit comprises an antenna circuit operable to receive said radio signals.
6. The radio receiver of claim 5, wherein said front-end receiver further comprises an amplifier circuit operable to amplify said received radio signals.
7. The radio receiver of claim 5, wherein said front-end circuit further comprises a filter circuit operable to filter said received radio signals.
8. The radio receiver of claim 7, wherein said filter circuit comprises a filter selected from the following group: high-pass filter, low-pass filter, band-pass filter, notch filter, and combinations thereof.
9. The radio receiver of claim 5, wherein said front-end circuit further comprises an intermediate frequency mixing circuit operable to translate said received radio signals to an intermediate frequency band.
10. The radio receiver of claim 1, wherein said digital processing system comprises:
  - a digital down converter operable to select said at least one of said channels within said frequency band; and
  - a digital signal processor operable to extract information from said at least one of said channels and generate said at least one output signal.
11. The radio receiver of claim 10, wherein said digital down converter selects said at least one of said channels according to configurable channel selection parameters.

12. The radio receiver of claim 11, wherein said configurable channel selection parameters are software configurable.
13. The radio receiver of claim 11, wherein said configurable channel selection parameters are selected from the following group: channel frequency, channel bandwidth, and combinations thereof.
14. The radio receiver of claim 10, wherein said digital signal processor extracts said information from said at least one of said selected channels according to configurable channel decoding parameters.
15. The radio receiver of claim 14, wherein said configurable channel decoding parameters are software configurable.
16. The radio receiver of claim 14, wherein said configurable channel decoding parameters are selected from the following group: channel frequency, channel modulation scheme, channel bandwidth, channel information format, and combinations thereof.
17. The radio receiver of claim 10, wherein said digital signal processor controls said digital down converter.

18. A radio receiver comprising:
  - at least one front-end circuit group comprising a plurality of front-end circuits, wherein each of said front-end circuits is operable to receive a plurality of radio signals transmitted across a frequency band and generate an analog signal corresponding to a plurality of channels within said frequency band;
  - at least one analog to digital converter coupled to said at least one front-end circuit group, said analog to digital converter operable to receive said analog signals from said front-end circuits and convert said analog signals to a digital signal; and
  - a digital processing system coupled to said at least one analog to digital converter, said digital processing system operable to receive said digital signal from said analog to digital converter and generate at least one output signal corresponding to at least one of said channels within said frequency band of at least one of said front-end circuits.
19. The radio receiver of claim 18, wherein said digital processing system is operable to generate a plurality of output signals, wherein each of said output signals corresponds to at least one of said channels within said frequency band of at least one of said front-end circuits.
20. The radio receiver of claim 18, wherein said radio signals received by any one of said front-end circuits are within a different frequency band than said radio signals received by the other of said front-end circuits.
21. The radio receiver of claim 18, wherein each of said front-end circuits comprises an antenna circuit operable to receive said radio signals.

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22. The radio receiver of claim 21, wherein at least one of said front-end circuits further comprises an amplifier circuit operable to amplify said received radio signals.
23. The radio receiver of claim 21, wherein at least one of said front-end circuits further comprises a filter circuit operable to filter said received radio signals.
24. The radio receiver of claim 21, wherein at least one of said front-end circuits further comprises an intermediate frequency mixing circuit operable to translate said received radio signals to an intermediate frequency band.
25. The radio receiver of claim 18, wherein said digital processing system comprises:
  - a digital down converter operable to select said at least one of said channels within said frequency band of at least one of said front-end circuits; and
  - a digital signal processor operable to extract information from said at least one of said selected channels and generate said at least one output signal.
26. The radio receiver of claim 25, wherein said digital down converter selects said at least one of said channels according to software configurable channel selection parameters.
27. The radio receiver of claim 25, wherein said digital signal processor extracts said information from said at least one of said selected channels according to software configurable channel decoding parameters.

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28. The radio receiver of claim 18, comprising a plurality of front-end circuit groups and a plurality of corresponding analog to digital converters, wherein said digital processing system is operable to receive a plurality of digital signals from said analog to digital converters and generate at least one output signal corresponding to at least one of said channels within said frequency band of at least one of said front-end circuits of at least one of said front-end circuit groups.

29. A radio receiver, comprising:

a plurality of front-end circuits each of which comprises an antenna circuit operable to receive a plurality of radio signals transmitted across a frequency band, wherein each of said front end circuits is operable to generate an analog signal corresponding to a plurality of channels within said frequency band;

a plurality of analog to digital converters each of which is coupled to at least one of said front-end circuits, wherein each of said analog to digital converters is operable to receive said analog signal from said at least one of said front-end circuits and convert said analog signal to a digital signal; and

a digital processing system coupled to each of said analog to digital converters, said digital processing system operable to receive said digital signals from said analog to digital converters and generate at least one output signal corresponding to at least one of said channels within said frequency band of at least one of said front-end circuits.

30. The radio receiver of claim 29, wherein at least one of said front-end circuits further comprises an amplifier circuit operable to amplify said received radio signals.

31. The radio receiver of claim 29, wherein at least one of said front-end circuits further comprises a filter circuit operable to filter said received radio signals.

32. The radio receiver of claim 29, wherein at least one of said front-end circuits further comprises an intermediate frequency mixing circuit operable to translate said received radio signals to an intermediate frequency band.

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33. The radio receiver of claim 29, wherein at least one of said analog to digital converters is operable to receive analog signals from a plurality of front-end circuits and convert said analog signals to a digital signal.



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34. A method of receiving radio signals, comprising:
- receiving a plurality of radio signals transmitted across a frequency band;
  - generating an analog signal from said received radio signals, said analog signal comprising a plurality of channels within said frequency band;
  - converting said analog signal to a digital signal to thereby digitize said plurality of channels within said frequency band; and
  - generating at least one output signal corresponding to at least one of said digitized channels within said frequency band.
35. The method of claim 34, further comprising amplifying said received radio signals.
36. The method of claim 34, further comprising filtering said received radio signals.
37. The method of claim 34, further comprising mixing said received radio signals to an intermediate frequency band.
38. The method of claim 34, wherein said output signal is generated by:
- applying software configurable channel selection parameters to said digital signal to select at least one of said digitized channels within said frequency band;
  - extracting information from said at least one of said selected digitized channels according to software configurable channel decoding parameters; and
  - conveying said extracted information within said output signal.
39. The method of claim 38, wherein said output signal comprises a time-domain multiplexed serial data link.

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40. The method of claim 39, further comprising generating a plurality of signals from said time-domain multiplexed serial data link for transmission to a plurality of end devices.
41. The method of claim 34, wherein a plurality of output signals are generated each of which corresponds to at least one of said digitized channels within said frequency band.
42. The method of claim 41, wherein said plurality of output signals comprise a plurality of signals for transmission to a plurality of end devices.

43. A radio receiver, comprising:

means for receiving a plurality of radio signals transmitted across a frequency band and generating an analog signal corresponding to a plurality of channels within said frequency band;

means for converting said analog signal to a digital signal; and

means for generating at least one output signal from said digital signal, said output signal corresponding to at least one of said channels within said frequency band.

44. The radio receiver of claim 43, wherein said output signal comprises a time-domain multiplexed serial data link.

45. The radio receiver of claim 44, further comprising means for generating a plurality of signals from said time-domain multiplexed serial data link for transmission to a plurality of end devices.